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**CLAIMS**

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[Claim(s)]

[Claim 1] (A) Polyorganosiloxane shown by mean unit formula  $RaSiO(4-a)/2$  (R is the congener, of a different kind un-replacing, or a substitute monovalent hydrocarbon radical, and a is the number of 1.90-2.70 here) 100 weight section (B) The impalpable-powder bulking agent 2 - 1000 weight section (C) The melting point is (A). Silicone constituent which is below pyrolysis temperature and consists of a solid-state-like low melting point metal or an alloy 5, - the 1000 weight section in ordinary temperature.

[Claim 2] (B) The silicone constituent according to claim 1 whose component is an impalpable-powder silica.

[Claim 3] Furthermore, (D) It is (A) about a conductive material. Component 100 Per [ 0.1-100 ] weight section Silicone constituent according to claim 1 or 2 which comes to carry out weight section combination.

[Claim 4] (C) It is (C) at the temperature beyond the melting point of a component. It is (A) about a component. (B) The claims 1-3 characterized by carrying out melting variance mixture with a component are the manufacture technique of a silicone constituent given in 1 term either.

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[Translation done.]

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Field of the Invention] this invention -- thermal conductivity, and an electromagnetic wave and absorption-of-radiation nature -- high -- thermal resistance and cold resistance -- or it is supposed at the thermolysis material which was excellent in conductivity further again, imaging material, radial slit protection material, etc. that it is useful, and it is related with the manufacture technique of obtaining the silicone constituent and it which are rich in homogeneity

[0002]

[The technical background and its trouble] of invention Since the silicone polymer is excellent in thermal resistance and cold resistance, in various fields, it is composite--ization-blended with the gestalt of grease, the gestalt of rubber, etc., and is suitably used for them. It is blended by the name of a grant agent or an additive for the purpose of giving the enhancement in the property, or another property further in composite-izing in addition to the essential property of the above-mentioned silicone. Although the matter of the shape of a liquid, such as the matter of the shape of a solid-state, such as various oxides, a ceramic, and an organic compound, or a silicone oil, in addition an organic compound, is used as the grant agent, in case of addition, homogeneity is an important problem. If a liquid solves the problem of a compatibility moderately, the homogeneity of level required for a constituent will be acquired, and the homogeneity of a constituent is acquired when a solid-state chooses the shape of an impalpable powder. A commercial grease constituent or a commercial rubber compound constituent is carried out in this way, and is prepared. Metals or those alloys are in the solid-state-like matter, and the property is it being rich in thermal conductivity and electrical conductivity, excelling in an electromagnetic wave and absorption-of-radiation nature, etc., and has the property which is not in a general ceramic and an organic compound. As an example using the characteristic feature of such alloys or those alloys, although \*\*\*\*\* the official report of No. 504554 [ two to ], JP,63-165302,A, JP,34-5583,B, JP,39-7619,B, JP,53-31275,B, etc. are mentioned, in order that all may acquire the homogeneity of a constituent, the silicone constituent which formed into combination composite the metal which is already an impalpable powder-like is shown. Therefore, even if it is an impalpable powder, particle size of people in general is too large, and the feeling of a rough deposit of the constituent cannot deny them. Even though these grants agent has gestalt change by shearing under kneading combination, it is the grade to which deformation of some and fragmentation are carried out, and such gestalt change does not have an operation essential to the effect of equalization.

[0003]

[Objects of the Invention] this invention aims at offering the silicone constituent which gave a metaled property, i.e., thermal conductivity, electrical conductivity, and an electromagnetic wave and absorption-of-radiation nature, and was more excellent in homogeneity.

[0004]

[Elements of the Invention] In order to attain the above-mentioned purpose, as a result of repeating a research zealously, by carrying out combination kneading of the metal or alloy which carries out melting at temperature lower than the pyrolysis temperature of a silicone polymer in the temperature region, this invention person finds out that the silicone constituent excellent in homogeneity can be obtained, and came to complete this invention. That is, this invention is (A) average unit formula  $\text{RaSiO} (4-a)/2$  (it is here). R The congener, of a different kind un-replacing or a substitute monovalent hydrocarbon radical, and a Polyorganosiloxane shown by the number of 1.90-2.70 100 weight section (B) The impalpable-powder bulking agent 2 - 1000 weight section (C) The melting point is (A). It is below pyrolysis temperature. The silicone constituent which consists of a solid-state-like low melting point metal or an alloy 5, - the 1000 weight section in ordinary temperature, and (C) It is (C) at the temperature beyond the melting point of a component. It is (A) about a component. (B) It is the manufacture technique of the above-mentioned silicone constituent characterized by carrying out melting variance mixture with a component.

[0005] (A) which constitutes this invention The polyorganosiloxane of a component It becomes the base polymer of this constituent, is shown by mean unit formula  $\text{RaSiO} (4-a) / 2$ , and is R. If it carries out Cycloalkyl base:vinyls [ , such as alkyl group:cyclohexyl ] , such as a methyl, an ethyl, a propyl, and butyl, The monovalent hydrocarbon group of halogenations, such as a \*\*\*\*\* methyl which replaced a part or all of a hydrogen atom that was combined with the carbon atom of aryl groups, such as alkenyl base:phenyls, such as an allyl compound, and a naphthyl, or these bases by the halogen atom, and a truffe \*\*\*\*\* propyl, etc. is illustrated. Express \*\* 1.90-2.70. moreover, viscosity [ in 25 degrees C in this polyorganosiloxane ] -- 100,000-200 million -- cSt if it is required to be in a domain and it is silicone grease or the base polymer of liquefied silicone rubber --

desirable -- It is the domain of 100-100,000cSt. When viscosity is under 10 cSt, the oil separability of the obtained grease or a liquefied silicone rubber compound becomes large, in 100,000 or more cSts, grease or a liquefied silicone rubber compound becomes viscosity too much, and workability is spoiled remarkably. Moreover, if this polymer is the base of millable type silicone rubber, it is this (A). That [ a component's ] whose domains are 1.90-2.05 is [ the shape of a straight chain and what is more close to the shape of a straight chain, i.e., a, ] desirable. viscosity -- 100000-200 million -- cSt Case where especially a manipulation workability sieve needs a mechanical strength from a domain although suitably chosen alternatively by the purpose of use, 2 million-200 million -- cSt The thing of the comparatively high viscosity of a domain is suitable.

[0006] Component (B) By silicone grease, an impalpable-powder bulking agent is also called a thickener and is indicated by the item of "additive practical use handbook for enlargement plastics and rubber" (chemical-industry company, common Narimoto year July issue) 6 bulking agent, or 7 reinforcing materials (p.487-787). For example, there are carbon black, a dry-type silica, a wet silica, quartz powder, a calcium carbonate, \*\*\*\*\*, an iron oxide, a ferrite, etc. Moreover, component (B) As an impalpable-powder bulking agent, you may be the metallic compounds etc. and the diamond impalpable powder which give thermal conductivity. In addition, a boron nitride, an aluminium nitride, a zinc white, an alumina, etc. are illustrated. Moreover, the front face may be processed and used for these impalpable-powders bulking agent by the silane, the silazane, the polysiloxane, etc. Component (B) Component mentioned later (C) The distributed assistant at the time of melting kneading is a thing. Component (B) Loadings are a component (A). 100 It is 2 - 1000 weight section to the weight section. If the \*\*\*\* effect, the reinforcement effect, and the effect as a dispersion medium are small when it is under 2 weight section, and 1000 weight section is exceeded, combination kneading will become it is remarkable and difficult, and also it is inferior to hyperviscosity-izing, a fluidity, and manipulation workability.

[0007] Component (C) It is the important component which constitutes this invention, and thermal conductivity, the electrical conductivity by the combination with a conductive bulking agent, or an electromagnetic wave and absorption-of-radiation nature is given. component (C) a metal or an alloy -- component (A) a silicone polymer -- setting -- \*\*\*\* -- temperature lower than the pyrolysis temperature (melting temperature) of the poly-dimethyl siloxane which is a general example -- namely, -- about -- Melting is carried out below 400 degrees C, and it is a solid-state-like thing in ordinary temperature. Such a thing has an indium, tin, a bismuth, \*\*\*\*\*, lead, etc. as a metal simple substance. Moreover, as an alloy, there is what is called solder, a wax, a low melting alloys, or a fusible alloy, and it is indicated by the item of a "chemistry handbook basic volume" (; June, Showa 59 issue edited by the Chemical Society of Japan) 4.1k low melting alloys, and solder (PI-509). That is, aluminum system solder etc. is in the solder and pan which consist of a bismuth, lead, tin, mercury or the \*\*\*\*\* alloy that consists of \*\*\*\*\*, a \*\*\*\*\* alloy, the Newton metal, \*\*\*\*\* metal, Lichtenberg alloy, a closing alloy, Rose's metal, Wood's metal, \*\*\*\*\* metal, a cello \*\*\*\*\* alloy, etc. tin, lead or a bismuth, an indium, \*\*\*\*\*, zinc, antimony, or silver.

Component (C) Loadings are a component (A). 100 It is 5 - 1000 weight section to the weight section. When thermal conductivity, and an electromagnetic wave and absorption-of-radiation nature are low when it is under 5 weight section, and 1000 weight section is exceeded, combination kneading becomes remarkably difficult and is inferior to uniform dispersibility.

[0008] The silicone constituent of this invention is the above-mentioned component (A). (B) (C) Component (C) It can manufacture by carrying out heating melting and carrying out distributed kneading at the temperature beyond the melting point. For example, component (A) It supplies to a closed mold kneading machine, for example, a kneader, Banbury, etc., and, next, is a component (B). Component ground moderately (C) Or liquefied component which carried out melting beforehand (C) Injection combination is carried out and it is a component (C). Combination procedures, such as heating and carrying out melting kneading at the temperature beyond the melting point, are illustrated. It is a component (B) into the metal of the melting status, and a polymer so that the liquefied metal fused as a combination procedure may furthermore carry out uniform variance more to a polymer. The technique of throwing in and kneading a bulking agent is desirable. Namely, component (B) Component (C) It has the effect of a distributed assistant. The silica with a high miscibility is desirable from such a meaning to a silicone polymer. It is a component (C) at a more nearly little silica. In order to carry out uniform melting variance, the big dry-type silica or wet silica of specific surface area is desirable. Thus, the manufactured silicone constituent is a component (C). It excelled in dispersibility very much, and the thing excellent in thermal conductivity is obtained.

[0009] further -- again -- constituent (A) / (B) / (C) Component (D) blending the carbon material which has conductivity, i.e., carbon black, a graphite, a carbon fiber, or poly-\*\*\*\*\* silane fiber -- the former -- component (D) of the amount of said \*\*\*\* -- the high conductivity which is not acquired is discovered It becomes what was furthermore stabilized by the conductive level of a half-conductivity field. The silicone constituent of this invention can offer the constituent excellent in thermal conductivity and conductivity. Such a component (D) Loadings are a component (A). 100 As opposed to the weight section 0.1-100 It is the weight section. Component (C) It is 0.1 although based also on loadings. The property made into the purpose if it is under the weight section is difficult to get, and it is 100. If the weight section is exceeded, combination kneading will become it is remarkable and difficult, and also it hyperviscosity-izes, and is inferior to a fluidity and manipulation workability.

[0010] To the silicone constituent of this invention, you may add a \*\*\*\*\*-ized agent well-known generally other than the above, an antioxidant, a metal powder, a metal fiber, a flameproofing agent, a heat-resistant additive, a pigment, a foaming agent, a cross linking agent, a curing agent, a vulcanizing agent, a release agent, etc. if needed. As such a thing, reinforcement nature bulking agents, such as a mist silica, a precipitation-method silica, a silicious marl, and non-conducting carbon black, an aluminum oxide, a mica, Clay, a zinc carbonate, a glass bead, a poly-dimethyl siloxane, an alkenyl machine inclusion polysiloxane, \*\*\*\*\* oxane, etc. are usually illustrated. Usefulness and need are embraced, it heat-treatment-mixes, and reduced pressure mixture of combination and the \*\*\*\*\* of each [ these ] additive component may be carried out, and it should just carry out

uniform variance using a closed mold kneading machine, 2 rolls, 3 rolls, a colloid mill, etc.

[0011] Thus, in addition to the property of original of silicone, the silicone constituent of the obtained this invention serves as grease excellent in thermal conductivity or electrical conductivity, and an electromagnetic wave and absorption-of-radiation nature, liquid rubber, and millable type rubber. In addition, what is necessary is just to blend a curing agent further, in order to acquire cross-linking grease and the rubber-elasticity field. Here, a curing agent is suitably chosen according to the reaction mechanism for acquiring cross-linking grease and the rubber-elasticity field. the reaction mechanism \*\*\*\*\* -- (1) The technique by the condensation reaction, and (2) bridge formation by the organic peroxide vulcanizing agent -- technique and (3) the technique by the addition reaction etc. knows -- having -- \*\*\*\* -- the reaction mechanism -- (A) What the desirable combination with a component, a curing agent, i.e., the catalyst for hardening, or a cross linking agent is decided for is common knowledge. (1) It is a component (A) if it is the technique by \*\*\*\*\*, and the so-called condensed type. What is necessary is just to carry out manufacture combination of the thing for which it has the hydroxyl group in polydyorganosiloxane, the adding-water resolvability silane metallurgy group catalyst, etc. As these adding-water resolvability silane metallurgy group catalyst Iron octoate, cobalt octoate, manganese octoate, \*\*\*\*\*, A \*\*\*\*\* pli rate, carboxylic-acid metal salt; dimethyl tin dioleate like tin oleate, Dimethyl \*\*\*\*\* laurate, dibutyltin dioleate, a diphenyl tin diacetate, Oxidization dibutyltin, a dibutyl \*\*\*\*\* methoxide, dibutyl screw (\*\*\*\*\* siloxy) tin, An organotin compound; ethyl silicate like dioctyl \*\*\*\*\* laurate, A propyl silicate, methyl trimetoxysilane, vinyltrimetoxysilane, Methyl triethoxysilane, vinyltriethoxysilane, a methyl tris (methoxyethoxy) silane, Alkoxy mold; methyltriacetoxysilane, such as a vinyl tris (methoxyethoxy) silane and \*\*\*\*\* propenoxysilane, Acetoxy type; \*\*\*\*\* (acetone oxime) silanes, such as vinyltriacetoxysilane, The partial hydrolysates, such as a \*\*\*\*\* (acetone oxime) silane, a \*\*\*\*\* (methyl ethyl ketoxime) silane, and a \*\*\*\*\* (methyl ethyl ketoxime) silane, are illustrated. Moreover, a cyclosiloxane like hexa methyl-screw (diethyl friend \*\*\*\*\*) cyclotetrasiloxane, tetramethyl dibutyl-screw (diethyl friend \*\*\*\*\*) cyclotetrasiloxane, \*\*\*\*\* methyl (diethyl friend \*\*\*\*\*) cyclotetrasiloxane, pen reservoir chill-tris (diethyl friend \*\*\*\*\*) cyclotetrasiloxane, hexa methyl-screw (methyl ethyl friend \*\*\*\*\*) cyclotetrasiloxane, and tetramethyl-screw (diethyl friend \*\*\*\*\*)-monochrome (methyl ethyl friend \*\*\*\*\*) cyclotetrasiloxane etc. is illustrated. Which structure is sufficient as these silanes and siloxanes, for example, as long as it is a siloxane, the shape of a straight chain, the letter of branching, and annular any are sufficient as the structure. Furthermore, in case these are used, it does not need to be limited to one kind and two or more sorts of combined use is also possible. (2) bridge formation by the \*\*\*\*\* peroxide-vulcanization agent -- if it is technique and the so-called organic peroxide vulcanization type -- component (A) What is necessary is just to carry out manufacture combination of the thing for which it has unsaturation nature hydrocarbon groups, such as a vinyl group, in polydyorganosiloxane, and the organic peroxide. As organic peroxide, benzoyl peroxide, 2, 4-dichlorobenzoyl peroxide, dicumyl peroxide, cumyl-t-butyl peroxide, 2, the 5-dimethyl -2, 5-G t-butyl par \*\*\*\*\*, G t-butyl peroxide, etc. are illustrated. These organic peroxide is used as one sort or two sorts or more of mixture. (3) The above-mentioned component which contains a vinyl group if it is the technique by \*\*\*\*\*, and the so-called addition-reaction type (A) In addition, what is necessary is just to carry out manufacture combination of the siloxane and the reaction catalyst of a platinum-group-metals compound which have a hydrogen bond silicon. As a platinum-group-metals compound, platinum system catalysts, such as a chloroplatinic acid, a platinum olefin complex, a platinum vinyl siloxane complex, platinum black, and a platinum triphenyl phosphine complex, are illustrated. It is good by the equipment used for bridge formation, a machinery, or well-known technique general also about a process condition well-known generally about the example of the constituent of these silicone constituent.

[0012]

[Effect of the Invention] Thus, the grease and silicone rubber which were obtained are applied or equipped between the electrical and electric equipment and radiation fins which need thermolysis since it has the property of the above-mentioned explanation, the heat which occurs from parts is told efficiently, and it is useful to protecting electrical-and-electric-equipment parts from the damage of generation of heat. Moreover, an effect is demonstrated to a control and thermolysis of static electricity as rubber for roll parts of a business-machine machine. Moreover, it is supposed as the core material or shield material of electrical wire, such as an ignition cable, at electric conduction material, an electromagnetic wave shielding material, etc. that it is useful. It can use as a medical related equipment or a charge of treatment material further again because of the protective effect to electromagnetic radiations, such as electromagnetic waves and gamma rays, such as microwave, and an X-ray.

[0013]

[Example] An example is given below and this invention is explained still in detail. In addition, viscosity expresses the viscosity in 25 degrees C among an example.

Example 1 component (A) It carries out, both ends are blocked by the trimethylsilyl machine, and viscosity is 1000cSts. The poly-dimethyl siloxane 50 weight section is taught to a closed mold kneading-machine kneader, and it is the inside of a tub. The temperature up was carried out so that it might become 150 degrees C. Next, component (B) It carries out and is specific surface area. The dry-type silica (Aerosil 130 and product made from Japanese Aerosil) 15 weight section and the component (C) of 130m<sup>2</sup>/g What carried out and ground Rose's metal (Bi-50, Pb-28, Sn-22, and melting point 100 degree C) in the diameter of several millimeters It kneaded, maintaining 150 degree C supplying 300 weight section to a small quantity [ every ] kneading machine simultaneously. It cools in the place as for which the metallic luster of an alloy disappeared and the whole carried out dark brown equalization, the temperature is lowered to a room temperature, and it is a component (A) further. It carried out, and both ends are blocked by the trimethylsilyl machine and viscosity carried out 50 weight section addition kneading of the poly-dimethyl siloxane of 300cSts. place which measured the workability of the obtained silicone grease based on JIS K 2220

400 -- it is -- moreover, thermal conductivity  $2.1 \times 10^{-3}$  cal/cm, deg, and sec it was .

[0014] Example 2 component (A) It carries out, both ends are blocked by the dimethyl hydro oxy-silyl machine, and viscosity is 1000cSts. Poly-dimethyl siloxane 100 weight section is taught to a closed mold kneading-machine kneader, and it is the inside of a tub. The temperature up was carried out so that it might become 150 degrees C. next, the silica (R-972 --) which processed and carried out the hydrophobing of the front face by the silane as a component (B) 20 weight section made from Japanese Aerosil, and component (C) Thing 200 which carried out and ground \*\*\*\*\* metal (Bi-50, Pb-25, Sn-25, and melting point 115 degree C) in the diameter of several millimeters It kneaded, maintaining 150 degree C supplying the weight section to a small quantity [ every ] kneading machine simultaneously. It cooled in the place as for which the metallic luster of an alloy disappeared and the whole carried out dark brown equalization, the temperature was lowered to the room temperature, and the room-temperature-curing type silicone rubber constituent was obtained. this constituent 100 weight section -- cross linking agent \*\*\*\*\* -- the partial hydrolysis and the condensate (ethyl-silicate 40, made in Union Carbide) 2 weight section of an ethyl silicate, and bridge formation -- catalyst \*\*\*\*\* -- dibutyl tin \*\*\*\*\* rate 0.4 Uniform mixture of the weight section was carried out. This was left for one week under a room temperature and moisture, and the rubber sheet was obtained. When rubber physical properties were measured based on JIS K 6301, they are hardness (JIS A) 55 and tensile strength. 30kgf/cm<sup>2</sup>, elongation It was 200%. moreover, thermal conductivity  $1.9 \times 10^{-3}$  cal/cm, deg, and sec it was .

[0015] Example 3 component (A) It carries out, both ends are blocked by the dimethyl vinyl silyl machine, and viscosity is the poly-dimethyl siloxane of 2000cSts. 100 weight section was taught to the closed mold kneading-machine kneader, and the temperature up of the inside of a tub was carried out so that it might become 150 \*\*. Next, the same component as an example 2 (B) What ground \*\*\*\*\* metal (Bi-50, Pb-27, Sn-13, Cd-10, and 70 degrees C of melting points) in the diameter of several millimeters as 20 weight section and a component (C) It kneaded, maintaining 150 degrees C supplying 100 weight section to a small quantity [ every ] kneading machine simultaneously. It cooled in the place as for which the metallic luster of an alloy disappeared and the whole carried out dark brown equalization, the temperature was lowered to the room temperature, and the added type liquefied silicone rubber constituent was obtained. this constituent both ends block with a trimethylsilyl machine as a cross linking agent among 100 weight section -- having -- viscosity -- 30cSts Poly-methyl \*\*\*\*\* siloxane 0.8 weight section and bridge formation -- catalyst \*\*\*\*\* -- the platinum complex of a methyl vinyl siloxane -- a platinum element -- carrying out -- Uniform mixture of the 0.001 weight section was carried out. This It heated for 10 minutes at 150 degrees C, and the rubber sheet was obtained. When rubber physical properties were measured based on JIS K 6301, they are hardness (JIS A) 50, tensile strength 40kgf/cm<sup>2</sup>, and elongation. It was 250%. Moreover, thermal conductivity  $1.8 \times 10^{-3}$  cal/cm, deg, and sec It obtained.

[0016] One to examples 4-13 and example of comparison 6 component (A) Carry out and both ends are blocked by the dimethyl vinyl silyl machine. a dimethyl siloxy unit and a methyl vinyl siloxy unit -- 1000 to 2 and viscosity 2000 10,000 -- cSt Polydyorganosiloxane crude rubber 100 weight section is used. Component (B) It carries out. A zinc oxide (a zinc white special number, Sakai Chemical Industry Co., Ltd. make), ferrite powder (the ferro top BSF547, Toda Kogyo Corp. make), a dry-type silica (Aerosil 200 and product made from Japanese Aerosil), and a wet silica (nip sill LP --) Japanese silica company make -- a component (C) \*\*\*\*\* -- C-1 (Wood's metal ;P b-25 and Sn-12.5 --) Bi-50, Cd-12.5, 70 degrees C of the melting points, and C-2 (fusible-alloy;Bi-56 --) Sn-40, Zu-4, melting point 130 degree C, and C-3 (cello \*\*\*\*\* alloy;Bi-58 --) Sn-42, melting point 139 degree C, and C-4 (solder ;P b-37 --) Sn-63 and the melting point About 184 degrees C, it is a component (D). The silicone rubber constituent was obtained by the composition which is carried out and is shown in Table 1 using carbon black (\*\*\*\*\* black EC, product made from lion \*\*\*\*\*), and a carbon fiber (\*\*\*\*\* HM45, product made from \*\*\*\* \*\*\*\*\*). As the manufacture technique of this constituent, any example uses a closed mold kneading-machine kneader, and it is a component (A). After an injection and component (C) A temperature up is carried out in temperature of about 10-30 degrees C or more beyond from the melting point, i.e., each melting point, and it is a component (B). Ground component (C) It supplied simultaneously and melting kneading was performed. Next, component (A) / (B) / (C) After obtaining a constituent, the temperature of the kneading inside of a plane is lowered to a room temperature, and it is a component (D). Uniform combination was carried out. However, it is accepted example 6 and is a component (B). The simultaneous injection of the component (C) is not carried out, but it is a component (B). Component (A) Component after carrying out full kneading in inside (C) It tried to blend. The composition rate of the above-mentioned example and the example of a comparison is collectively shown in Table 1.

[0017]

[Table 1]

	実 施 例										比 較 例					
	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6
成分A) 約15%の生ゴム	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
成分B) 微粉末充填剤																
酸化亜鉛	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
フェライト粉	—	—	—	10	—	—	—	—	—	—	—	—	10	—	—	—
乾式シリカ	—	20	20	10	20	15	15	15	15	15	20	—	10	15	15	15
湿式シリカ	—	—	—	10	—	—	—	—	—	—	—	—	10	—	—	—
成分C) 金属																
C-1	—	—	—	100	—	100	100	100	100	—	—	—	—	—	—	—
C-2	200	300	300	—	—	—	—	—	—	—	—	300	—	—	—	—
C-3	—	—	—	—	—	—	—	—	—	200	—	—	—	—	—	—
C-4	—	—	—	—	400	—	—	—	—	—	—	—	—	—	—	—
成分D) 炭素材料																
カーボンブラック	—	—	—	—	—	0.5	1	2	4	—	—	—	—	0.5	2	4
カーボン繊維	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—

[0018] Hereafter, each example (4-13) and the example (1-6) of a comparison are explained separately.

The [example 4] book constituent was the ashes brown uniform field. this constituent 100 weight section -- vulcanizing agent \*\*\*\*\* -- organic peroxide 2 and the 5-dimethyl -2 -- 5-\*\* (ter-butylperoxy) hexane 0.3 weight section combination is carried out -- the press forming was performed for 10 minutes at the temperature of 170 degree C, and the rubber sheet was obtained. When rubber physical properties were measured based on JIS K 6301, they are hardness (JIS A) 60, tensile strength 50kgf/cm<sup>2</sup>, and elongation. It was 200%. moreover, thermal conductivity 2.3x10<sup>-3</sup> cal/cm, deg, and sec it was .

[0019] Although composition of the examples 5 and 6 and the [examples 1 and 2 of comparison] examples 5 and 6 is the same, since manufacture procedures differ, although the constituent of an example 5 is the dark brown uniform field, the constituent of an example 6 is a component (C). The minute lump which has the metallic luster which is a non-distributed object existed. Compared with an example 6, the distributed status of the example 2 of a comparison is still bad, and it is almost a component (A). Component (B) It was not unifying. When rubber was fabricated by the same vulcanizing agent and thermal conductivity was compared with having performed the constituent of an example 5 and the example 1 of a comparison in the example 4, 6 times as many thermal conductivity nature as this was shown.

[0020] The constituent of the example 7 and the [example 3 of comparison] example 7 was the black uniform field. This constituent It is 2 and 5-dichlorobenzoyl peroxide as a vulcanizing agent to 100 weight section. The rubber foam was obtained, when the azobisisobutyronitril 2 weight section was blended and the microwave of 2450MHz and 600W was irradiated for 2 minutes as 0.1 weight section, the dicumyl peroxide 2 weight section, and a foaming agent. On the other hand, hardening and the foaming were inadequate when microwave hardening was tried with the vulcanizing agent with the same said of the example 3 of a comparison, and the foaming agent.

[0021] The example 8 and the [example 1 of comparison] book constituent were the dark brown uniform fields. thermal conductivity of the rubber obtained by vulcanizing similarly with having carried out in the example 4 2.3x10<sup>-3</sup> cal/cm, deg, and sec it was . Moreover, this constituent 100 It is the component (A) of Table 1 to the weight section. 50 weight section addition kneading was carried out at the pan. It vulcanized similarly with having performed the obtained constituent in the example 4, and the 1mm rubber sheet was obtained. It placed on vulcanization rubber sheet-(b) which obtained this piece [ of a rubber sheet ]-(b) in the example 1 of a comparison, and when roentgenography based on ISO 4049 was performed, the clear image of piece [ of a sheet ]-(b) was obtained. Imaging nature was 4 times the aluminum plate.

[0022] The constituent of the example 9 and the [example 4 of comparison] this example was the black uniform field. The example 9 and the example 4 of a comparison are 100, respectively. It is 2 and 4-dichlorobenzoyl peroxide as a vulcanizing agent to the weight section. 0.5 weight section was blended. This When it was left for 10 minutes in the 200-degree C oven, vulcanized rubber also with surface sufficient hardenability was obtained. Moreover, although vulcanized rubber also with surface hardenability sufficient in the example 9 was obtained in the same vulcanizing agent compound when the same microwave vulcanization as an example 7 was performed, the example 4 of a comparison was in the status that it does not vulcanize.

[0023] The molding sheet was created with having carried out in the example 4 using the same vulcanizing agent to the constituent of the examples 10, 11, and 12, the [examples 5 and 6 of comparison] examples 10, 11, and 12, and the examples 5 and 6 of a comparison. They are JIS C 2123 or Society of Rubber Industry, Japan standard SRIS 2301 about the volume resistivity of this rubber sheet. It was based, and when measured, the exponents (order) of the value (unit omega and cm) of the examples 10, 11, and 12 and the examples 5 and 6 of a comparison were 6, 2, 1, 15, and 2, respectively. An example's change of conductivity is small to change of the loadings of carbon black, and it is high. [ of conductivity ]

[0024] The [example 13] book constituent was the black uniform field. When microwave vulcanization was performed with having carried out in the example 9 using the same vulcanizing agent, the vulcanized rubber also with surface good hardening was obtained.

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[Translation done.]